NEWS REPORT

NATIONAL ACADEMY OF SCIENCES
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NEWS REPORT

National Academy of Sciences National Research Council

VOLUME X *July–August 1960* NUMBER 4

Activities of the Space Science Board

HUGH ODISHAW

Executive Director, Space Science Board

THE SPACE Science Board of the Academy-Research Council was established by the President of the Academy in June 1958 in response to both national and international research interests. The problems and opportunities of space science have constituted the principal subjects of consideration at some 25 formal meetings of the Board and its committees, and at many additional informal sessions.

Domestically the Board serves in an advisory capacity to the agencies of the Government responsible for execution of the national space science effort—in particular, therefore, to the National Aeronautics and Space Administration (NASA) and the National Science Foundation (NSF) which are primarily concerned with fundamental science. The Board has also sought to broaden the scientific base for current and future United States space science efforts by encouraging scientists to interest themselves in the needs and opportunities of space research and by affording the scientific community a forum for discussion of space research problems.

Internationally the Board serves as the Academy's vehicle for cooperation with space scientists of other countries, working through the Committee on Space Research (COSPAR) of the International Council of Scientific Unions (ICSU).

The current membership of the Board is as follows:

LLOYD V. BERKNER, President, Associated Universities Inc,, *Chairman*
HARRISON BROWN, California Institute of Technology
LEO GOLDBERG, Harvard University
H. KEFFER HARTLINE, The Rockefeller Institute
DONALD F. HORNIG, Princeton University
WILLIAM W. KELLOGG, The Rand Corporation
CHRISTIAN J. LAMBERTSEN, University of Pennsylvania
JOSHUA LEDERBERG, Stanford University
RICHARD W. PORTER, General Electric Company
BRUNO B. ROSSI, Massachusetts Institute of Technology
ALAN H. SHAPLEY, National Bureau of Standards, Boulder, Colo.
JOHN A. SIMPSON, University of Chicago
HAROLD C. UREY, University of California at La Jolla
JAMES A. VAN ALLEN, State University of Iowa
O. G. VILLARD, JR., Stanford University
HARRY E. WEXLER, U. S. Weather Bureau
GEORGE P. WOLLARD, University of Wisconsin
HUGH ODISHAW, *Executive Director*
R. C. PEAVEY, *Secretary*

Members of the Board serve as chairmen of 15 specialized committees covering the various scientific disciplines and fields of activities associated with the country's space science program. All told, approximately

140 scientists from several fields serve on the Board and its committees. The committees and their chairmen are as follows: 1—Chemistry of Space and Exploration of the Moon and Planets, Harold C. Urey; 2—Optical and Radio Astronomy, Leo Goldberg; 3—Future Vehicular Development, Donald F. Hornig; 4—International Relations, Richard W. Porter; 6—Space Projects, Bruno B. Rossi; 7—The Atmospheres of the Earth and Planets, Alan H. Shapley; 8—Physics of Fields and Particles in Space, John A. Simpson; 9—General Engineering Service and Coordination, O. G. Villard, Jr.; 10—Meteorological Aspects of Satellites, Harry E. Wexler; 11—Biological Research, H. Keffer Hartline; 12—Geodesy, George P. Wollard; 13—Upper Atmosphere Rocket Research, William W. Kellogg; 14—Exobiology, Joshua Lederberg; 15—Environmental Biology (chairman to be announced); and 16—Man in Space, Christian J. Lambertsen.

Background

Planning and over-all technical direction of the United States rocket and satellite programs during the International Geophysical Year (IGY) was the responsibility of the Academy's U. S. National Committee for the IGY. Before the end of IGY, when the probable scope of future United States space efforts became apparent, the IGY Committee concluded that these developments required broad recognition and study. It was deemed important that the United States space science program be broadly based throughout the country's scientific community. Moreover, although COSPAR had not yet been established, it was clear that ICSU would devise some means for continuing IGY cooperation in space science, as it had already done in the case of oceanic and Antarctic research.

The importance of these considerations for the future development of the nation's programs in space science was also recognized by officials in several government agencies. Formation of the Space Science Board by the President of the Academy was welcomed by these agencies. In his instructions to the Board, President Bronk provided the following basis for its activities:

> It is my hope that the Board will give the fullest possible attention to every aspect of space science, including both the physical and the life sciences. I believe that we have a unique opportunity to bring together scientists from many fields to survey in concert the problems, the opportunities, and the implications of man's advance into space, and to find ways to further a wise and vigorous national scientific program in this field.
>
> We have talked of the main task of the Board in three parts—the immediate program, the long-range program, and the international aspects of both. In all three we shall look to the Board to be the focus of the interests and responsibilities of the Academy—Research Council in space science; to establish necessary relationships with civilian science and with governmental scientific activities, particularly the proposed new space agency, the National Science Foundation, and the Advanced Research Projects Agency; to represent the Academy—Research Council in our international relations in this field on behalf of American science and scientists; to seek ways to stimulate needed research; to promote necessary coordination of scientific effort; and to provide such advice and recommendations to appropriate individuals and agencies with regard to space science as may in the Board's judgment be desirable.

Space Science Objectives

In considering its functions within the framework of President Bronk's instructions, the Board concluded that its activities should be organized to contribute to three separate and distinct major objectives: *1*) the achievement of a sound program in space exploration; *2*) the conduct of a sound scientific program; and *3*) the exploitation of space opportunities for the benefit of mankind.

The achievement of the first objective—sound space exploration—requires, of course, the prior provision of adequate, powerful vehicles, which *per se* is not a responsibility of the Space Science Board. However, the Board has emphasized the need for such vehicles and the obvious necessity for adequate support of both conventional and radical approaches to their development.

The second objective—a sound scientific program—falls directly within the Board's particular area of competence, and accordingly the bulk of its activities has been directed to the development of both short-range and long-range space science recommendations.

Concerning the third objective—space benefits to mankind—there can be no ques-

tion that practical applications of immense importance (particularly in communications, navigation, and meteorology) will result from space efforts. The Board has sought to encourage appropriate technical activities in this area.

Domestic Activities

As soon as it was established, the Board asked for proposals and suggestions from the country's scientific community for new projects in space science research to follow the satellite and rocket programs of the IGY. The Board's committees assessed some 200 proposals and made recommendations to NASA and NSF in the fall of 1958 and early in 1959. These studies helped provide guidance for the organization of the immediate post-IGY space research program now being conducted and contributed to an orderly transition from the IGY period to the post-IGY effort. The Board then turned its attention to the development of recommendations for a short-range space science program. Included in this effort were a series of visits to the country's major space research, development, and launching facilities in order to ascertain the state of the research being conducted, to single out major problems requiring solution, and to devise the best possible means of drawing broadly upon the talents of scientists throughout the nation in the conduct of the space research program.

With the problem of the immediate requirements of the national space program behind it, the Board is now giving attention to the longer-range objectives and problems of space science—in particular problems of the next decade—and to examination of the scope and adequacy of fundamental research necessary for the support of future space science experiments.

The Board has prepared a nine-part survey on "Science in Space," which broadly examines opportunities and objectives of space science for the coming years. Seven chapters, prepared by eminent American scientists in various fields, have already been issued: "The Nature of Gravitation," "The Earth," "The Moon," "The Planets," "The Sun," "Physics of Fields and Energetic Particles in Space," and "The Biological Sciences and Space Research." The remaining two chapters, "A General Review" and "Galactic and Extragalactic Astronomy," are expected to be issued this summer. Each chapter is available from the Academy–Research Council's Printing and Publications Office for $1.00. The survey outlines major areas of fundamental scientific research, indicates general objectives for the national space program, and suggests to scientists the opportunities and challenges implicit in this vast new area of study.

"Research in Space," an earlier article prepared by the Board and published in the July 24, 1959, issue of *Science*, outlined the prospects of space science for the scientific community.

On April 29 and 30, 1959, a symposium was held in Washington on the exploration of space. Sponsored jointly by the Board, NASA, and the American Physical Society, the symposium reviewed, for nearly a thousand scientists from all over the United States, space research findings up to that time and discussed the broad objectives of future research programs in all fields of space science. On June 24, 1960, in connection with its eighth meeting, the Board held a Planetary Atmospheres Conference in Arcadia, California.

Under the Board's auspices, a number of special ad hoc study committees have been established to consider, on behalf of scientists generally, specific problems or neglected areas affecting space research. Among these have been: *1*) the consequences of contamination of extraterrestrial bodies by impacting space probes, and recommendations for a program to prevent this contamination; 2) the need for exclusive allocations of radio frequencies for use in space research; 3) ground-based radar astronomy to provide back-up support to the space sciences program; *4*) the photochemical aspects of space exploration; 5) the chemical analysis of meteorites; and *6*) a study of sounding rocket research efforts.

Another Board activity, the Rocket and Satellite Data Center, represents a significant function both nationally and internationally. Established during the IGY, this center provides a means for international exchange of scientific data resulting from

rocket and satellite programs. Through this center, announcements of launchings have been made available to observers throughout the world for tracking and observational purposes; summary descriptions of space programs have been made available; and two series of reports have been issued. One series deals with sounding rocket research results; the other with satellite and space probe findings. To date, five reports have been issued in the rocket series and eleven reports in the satellite series; each report is available from the Printing and Publications Office for $1.00. Several additional reports in each series are in preparation. The center has also maintained an archive of the results and documents from other countries; some 1,000 reports and published papers have been acquired.

International Activities

As noted, the Space Science Board provides United States representation on the ICSU Committee on Space Research (COSPAR), organized in October 1959. Richard W. Porter, chairman of the Board's Committee on International Relations, serves as the Academy's delegate to COSPAR. COSPAR provides an effective means for scientists to consider internationally the broad objectives of space research; it also provides an active forum for international discussion of these topics and promotes international collaboration in operational space research programs.

The international activities of the Board have been supported by NASA. At the March 1959 meeting of COSPAR, the National Academy of Sciences' representative was able to invite international participation in the NASA program. This offer included the launching of space experiments or complete payloads developed in other countries. This offer to COSPAR has already increased the interest of scientists in several countries in conducting space experiments; perhaps the most notable is the full-fledged satellite program developed by British scientists with NASA collaboration. Last January at the Third COSPAR Assembly in Nice, France, the Academy was able to announce that the telemetry codes for experiments flown in Explorer VII would shortly be made available to all qualified scientists throughout the world, thus furthering international cooperation in the analysis of fundamental scientific observations deriving from this satellite.

The First International Space Science Symposium was held at Nice, France, January 11–15, 1960, in conjunction with the COSPAR plenary assembly mentioned above. This symposium included 101 papers contributed by scientists from many nations, with international participation numbering approximately 300 persons. Directed toward a review of space science results to date, the symposium also examined possibilities in this field for the immediate future. The Board coordinated the United States effort; 45 papers were presented, and some 75 American scientists participated in the symposium.

On behalf of COSPAR, the Board also arranged for the United States to participate in an internationally coordinated program of scientific rocket soundings of the upper atmosphere which took place November 16–22, 1959. The United States' contribution included 10 rockets launched by three scientific institutions in this country. The Board has also participated in developing plans for a COSPAR rocket week to be observed this year September 16–22. Current plans call for some 50 rocket launchings by United States scientists. It is anticipated that this internationally coordinated program will become an annual event.

NEW DIVISION CHAIRMEN

Detlev W. Bronk, President of the National Academy of Sciences, has announced the appointment of the following chairmen of Divisions of the Academy–Research Council.

J. Barkley Rosser, Division of Mathematics
Edward P. Espenshade, Jr., Division of Earth Sciences
Robert C. Elderfield, Division of Chemistry and Chemical Technology
Emil W. Haury, Division of Anthropology and Psychology

Dr. Rosser, professor of mathematics at Cornell University, has succeeded Samuel S. Wilks, professor of mathematical statistics at Princeton University. Dr. Wilks had served as Division chairman since 1958. Dr. Rosser has been active in the Division of Mathematics since 1951. He received his Ph.D. degree from Princeton University in 1934. After serving as a research fellow at Princeton and Harvard Universities, Dr. Rosser joined the faculty of Cornell University in 1936 and was appointed professor of mathematics in 1943. Known primarily for his work in symbolic logic, Dr. Rosser has a long record of accomplishment in the field of rocket ballistics. He served as chief of the rocket ballistics division, Allegany Ballistics Laboratory, from 1944 to 1946, and was director of the Army Ordnance's Project ART from 1951 to 1952. For three years, 1955–58, Dr. Rosser was a member of the Advisory Group on Special Capabilities (also known as the "Stewart" Committee), whose studies were instrumental in the United States' decision to launch an earth satellite during the International Geophysical Year. The new chairman also serves on various other committees advising the Government on mathematics. In 1948, he was a recipient of the Presidential Certificate of Merit for military research on rockets during the war. Dr. Rosser is currently on leave from Cornell as Director of the Communications Research Division, Institute for Defense Analysis.

Dr. Espenshade, chairman of the department of geography at Northwestern University, has been appointed chairman of the Division of Earth Sciences. Dr. Espenshade succeeded John N. Adkins, Director of the Earth Sciences Division, Office of Naval Research, who had served as chairman since July 1, 1958. A graduate of the University of Chicago, Dr. Espenshade returned there for his master's degree in 1932 and his doctorate in 1944. Dr. Espenshade also served the university as instructor in geography, after a brief tour of duty with the Illinois Geological Survey. During World War II, he left academic life to serve as editor of foreign maps for the U. S. Army Map Service and as a member of the Hough team, an engineer–intelligence group dispatched to Europe to unravel the mapping system used by the German forces. At the end of the war, Dr. Espenshade joined the faculty of Northwestern University; he was appointed to his present post there in 1958. Also, during that year, he traveled widely throughout Asia engaged in research on land use.

Dr. Elderfield, professor of chemistry at the University of Michigan, has been appointed chairman of the Division of Chemistry and Chemical Technology, succeeding Ernest H. Volwiler, President of Abbott Laboratories, who has served as chairman since July 1, 1958. Dr. Robert W. Cairns, Director of Research, Hercules Powder Company, was named chairman–designate. Dr. Elderfield has earned a wide reputation as an organic chemist whose research interests have been centered in chemotherapy and pharmacology. In recognition of his contributions to the field of malarial drugs while serving with the Office of Scientific Research and Development during the Second World War, he was awarded the Presidential Certificate of Merit in 1948. The new chairman is also recognized as an authority on heterocyclic compounds and has edited five volumes concerning these compounds. He has served also on the editorial board of the Journal of Organic Chemistry, 1952–56.

Dr. Elderfield received his Ph.D. degree from the Massachusetts Institute of Technology in 1930. Following a year as an instructor in chemistry at Colby College,

he was appointed an assistant at The Rockefeller Institute in 1930, rising to associate in 1932. Four years later Dr. Elderfield was named an assistant professor at Columbia University, becoming a full professor in 1941. In 1952, he accepted his present position as professor of chemistry at the University of Michigan.

Dr. Haury, professor and head of the department of anthropology at the University of Arizona, has been appointed chairman of the Division of Anthropology and Psychology. Dr. Haury succeeded Neal E. Miller, James Rowland Angell Professor of Psychology at Yale University, who had served as chairman since July 1, 1958. Dr. Haury is widely recognized as an authority on the early cultures of Southwestern United States, a region in which he has excavated, studied, and taught for more than three decades. His particular interests have been the Pueblo, Mogollon, and Hohokam remains. His work in archaeology received special recognition in 1950 when he was named the recipient of the Viking Fund Medal. A member of several professional societies, Dr. Haury served as president of the Society for American Archaeology in 1944 and president of the American Anthropological Association in 1955. From 1930 to 1937, Dr. Haury served as the assistant director of Gila Pueblo, a privately endowed research institute in Arizona. In 1934, he received his Ph.D degree in archaeology from Harvard University and, in 1937, was appointed to his present position at the University of Arizona.

FOREIGN STUDENT ADVISER AWARDS

The Committee on International Exchange of Persons has issued an announcement of two special awards for Foreign Student Advisers under the Fulbright Program for 1961–62 in India and Pakistan. These awards were established as a contribution towards the improvement of foreign student counseling in American colleges and universities, and as a means of furthering the mutual understanding of higher education in the respective participating countries. Application forms may be obtained from the Committee on International Exchange of Persons, Academy–Research Council. The closing date of the competition is October 1, 1960.

THE INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES

The International Union for Conservation of Nature and Natural Resources held its Seventh General Assembly in Poland at Warsaw and Cracow, June 15–24. Two hundred delegates from thirty-one countries were in attendance.

As in previous assemblies, there were plenary sessions and a series of meetings of the Union's Commissions on Conservation Education, Ecology, National Parks, and the Survival of Vanishing Species. There were also special technical sessions. The keynote address at the first technical meeting on "The Impact of Man and Modern Technological Development on Nature and Natural Resources" was given by Fairfield Osborn and ended with an appeal for world action by the United Nations Assembly to preserve our natural heritage. Pierre Gourou of France also gave a stimulating review of the status of conservation.

The subjects of the other technical meetings were "The Management of Wild Grazing Animals in Temperate Zones in Relation to Land Use" under the chairmanship of the French mammalogist, F. Bourliere, and "The Ecological Effects of Biological and Chemical Control of Undesirable Plants and Animals" under the chairmanship of the Dutch zoologist, D. J. Kuenen. There was active discussion of the papers presented, which was aided by the facilities for simultaneous translation into French and Russian.

The final sessions of the assembly were held in Cracow where the Union adopted 14 resolutions dealing with such subjects as conservation education, ecological research in holarctic forests, the protection of the mountain gorilla habitat, and an important special African project.

The assembly decided to move the Union's headquarters from Brussels to Switzerland and to hold the next general assembly in Africa, possibly in Nairobi in 1963.

1961-62 FULBRIGHT AWARDS

The Committee on International Exchange of Persons has announced the 1961–62 awards authorized under the Fulbright Act for university lecturing and advanced research in the participating countries of Europe, the Near and Far East, and Africa. Awards for 1961–62 are offered in Austria, Belgium and Luxembourg, China (Taiwan), Denmark, Finland, France, Germany, Greece, Iceland, Iran, Ireland, Israel, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Turkey, the United Arab Republic, the United Kingdom, and the United Kingdom Colonial Dependencies in Africa, Asia, and the Mediterranean. The closing date for application is October 1, 1960. The announcement and application forms may be obtained from the Committee on International Exchange of Persons, Academy–Research Council.

Recent special activities have included a limited exchange program with Iraq under the Smith–Mundt Act, and a program providing 20 travel grants to American professors interested in undertaking, during the summer of 1961, an intensive survey of the history, institutions, and culture of India with a view to enriching their teaching in the United States.

BUILDING RESEARCH INSTITUTE NEW OFFICERS

Harold L. Humes, Baldwin-Ehret-Hill, Inc., was re-elected to a second term as President of the Building Research Institute and Chairman of the Executive Committee. Robert W. Cutler, of Skidmore, Owings and Merrill, was re-elected to a second term as Vice President and Vice Chairman of the Executive Committee. For the first time this year, two additional Vice Presidents were elected: Graham J. Morgan, of United States Gypsum Co. and Peter B. Gordon of Wolff and Munier, Inc.

Newly appointed to the Board of Governors are the following members: Jack E. Gaston, Building Materials Research, Armstrong Cork Company; Grayson Gill of Grayson Gill, Inc.; T. F. Olt, Armco Steel Corporation; Howard C. Hardy of Howard C. Hardy and Associates; and Walter Sanders, University of Michigan.

A STUDY OF RUSSIAN EDUCATION IN SCIENCE AND ENGINEERING

In 1955 a study of Russian education in science and engineering was published jointly by the National Academy of Sciences–National Research Council and the National Science Foundation. Nicholas DeWitt of the Russian Research Center, Harvard University, was responsible for the research effort and the writing of the volume.

Because of the significance of this study, it was deemed appropriate to rewrite the volume, bringing the information up to date. This was particularly important in view of the substantial changes in Russian educational policy occurring over the past year or two. The present work has just been completed and is now being reviewed. It will probably be submitted to the Government Printing Office for production late in August and should be available in the early fall.

Because of the increased volume of information available on the Russian educational system and on Soviet professional manpower, the new work will make possible a much more complete understanding of the scope and nature of the Russian educational effort and the status of scientific and technical manpower in the Soviet Union.

GORDON RESEARCH CONFERENCE ON CRITICAL TABLES

The Office of Critical Tables sponsored a Gordon Research Conference on "Information Processing for Critical Tables of Scientific Data" at New Hampton, N. H., during the week June 20–24. Guy Waddington of the Office of Critical Tables served as chairman and Bruno J. Zwolinski of the Carnegie Institute of Technology as vice chairman. The 61 persons attending included experts from most of the established United States and European numerical data centers. Also present were a number of younger scientists interested in developing sound procedures for the evaluation, processing, compilation, and publication of numerical data in selected areas of the physical sciences.

The program began with a consideration of the philosophical and historical aspects of critical tables preparation. This was followed by papers and discussions on the operational patterns and problems of current efforts in the field. Another broad area on the agenda related to the exact presentation of scientific information. Topics discussed in this area included unit systems, fundamental physical constants, nomenclature, and codification. Other topics included *a*) the detailed treatment of conflicting data, *b*) the relationship of basic research planning to finished tables of data, *c*) problems of indexing and ordering, and *d*) and the role of machines in literature imaging, property correlations, and the computation of property values.

VISITING INTERNATIONAL SCIENTIST PROGRAM IN THE GEOSCIENCES

During the spring semester of 1960 the American Geological Institute, aided by a grant from the National Science Foundation, sponsored visits by six internationally known scientists to the United States for lecture visits to university geology-geophysics departments. The visiting scientists who came especially to the United States to participate in this program were Paul Ramdohr, University of Heidelberg, Augustin Lombard, University of Geneva, and Stevenson Buchan, Assistant Director of the Geological Survey of Great Britain. Each of these scientists spent approximately three months in the United States. During their stay they each made eight 1-week visits to college and university departments to lecture and discuss geological research. The visitors also participated in field trips and inspected some major United States research centers.

Also participating in the program were three foreign scientists already in this country: T. J. van Andel (Groningen) now at Scripps Institution of Oceanography, Douglas Coombs (University of Otago, Dunedin, New Zealand) now at Pennsylvania State University, and S. Warren Carey (University of Tasmania) now at Yale.

TRANSLATIONS PROGRAM OF THE AMERICAN GEOLOGICAL INSTITUTE

The American Geological Institute is currently responsible for the publication of three translation journals under the translations program started in 1958. These journals—*International Geology Review; Izvestiya* of the Academy of Sciences of the U.S.S.R., Geologic Series; and *Doklady* of the Academy of Sciences of the U.S.S.R., Earth Science Sections—were established for the purpose of making available to United States geologists and geophysicists significant contributions to pure and applied research in the geological sciences which have appeared in foreign language journals. Primary emphasis has been placed on translating Russian literature, but the *International Geology Review* includes material from Chinese, Japanese, and other difficult language literature.

Members of the Advisory Committee on Translation are:

EARL INGERSON, University of Texas, *Chairman*
EUGENE A. ALEXANDROV, Columbia University
E. C. T. CHAO, U. S. Geological Survey
JAMES W. CLARKE, U. S. Geological Survey
DEAN F. FRASCHE, Union Carbide Company
ALEXANDER GAKNER, U. S. Bureau of Mines
JOHN K. HARTSOCK, U. S. Atomic Energy Commission
HENRY HOTCHKISS, Standard Oil Company of New Jersey
KURT E. LOWE, City College of New York
BRIAN MASON, American Museum of Natural History
JOHN RODGERS, Yale University
FRANK C. WHITMORE, JR., U. S. Geological Survey

PANEL APPOINTED FOR LEGISLATIVE HEARINGS

Detlev W. Bronk, President of the National Academy of Sciences, in accordance with a request from Oren Harris, Chairman of the House of Representatives Committee on Interstate and Foreign Commerce, appointed a panel of scientists to review and discuss with the Committee scientific aspects of legislation dealing with safe color additives in foods, drugs, and cosmetics. The Committee sought scientific information regarding the possible establishment of safe tolerances for food or color addi-

tives known to induce cancer in man or animals. The panel met with the Congressional Committee on April 5 and 6, 1960.

With the advice and concurrence of the Divisions of Biology and Agriculture and Medical Sciences, those appointed to the panel were:

WILLIAM J. DARBY, Vanderbilt University School of Medicine, *Chairman*

HAROLD F. BLUM, Princeton University

PAUL R. CANNON, University of Chicago

FLOYD DE EDS, U. S. Department of Agriculture

CHARLES J. KENSLER, School of Medicine, Boston University

MORTON L. LEVIN, Roswell Park Memorial Institute

G. BURROUGHS MIDER, National Institutes of Health

JAMES A. MILLER, University of Wisconsin

WALTER S. O'DONNELL, Sloan-Kettering Institute for Cancer Research

PHILIPPE SHUBIK, Chicago Medical School

HAROLD L. STEWART, National Institutes of Health

ALBERT TANNENBAUM, Medical Research Institute, Michael Reese Hospital

M. R. ZAVON, Kettering Laboratory of Industrial Health

MEETING OF LIBRARIANS IN THE BUILDING INDUSTRY

The Office of Documentation of the National Academy of Sciences–National Research Council had a special meeting on June 9 in Cleveland for librarians dealing with building information to examine common problems. Date and place were chosen to coincide with the annual meeting of the Special Libraries Association in that city. Four papers were presented by librarians from Housing Home Financing Agency, American Institute of Architects, National Association of Real Estate Boards, and University of California, with a summary by Karl Baer, Librarian of the National Housing Center. Some 50 librarians were invited to participate in the discussion of the papers and in a comparison of their problems particularly with respect to the handling of periodical literature. John Sherrod of the Library of Congress served as chairman of the meeting and members of the Building Research Institute Subcommittee on Documentation of the Research Committee were invited to attend as observers.

INTER-AMERICAN ACTIVITIES

The Academy's responsibilities in the Inter-American area are briefly summarized in reports of recent activity in this field.

Sverre Petterssen, Professor of Meteorology at the University of Chicago and Past President of the American Meteorological Society, completed a tour of approximately one month in Latin America. Dr. Pettersen visited the leading universities in Peru, Chile, Argentina, and Brazil to discuss various aspects of their meteorology programs. Particular stress and the major portion of his time was spent in Chile assisting the University of Chile, which has specifically requested advice and counsel in the establishment of a program in meteorology.

An inter-disciplinary team has been appointed in accordance with a recommendation of the Committee on Inter-American Scientific Cooperation. This group, which left on June 20, 1960, and remained in the field for approximately one month, conducted a careful examination of the existing programs in the seven universities of Chile. The group is composed of Charles F. Bonilla, Professor of Civil Engineering, Columbia University; Farrington Daniels, Professor Emeritus, Solar Energy Laboratory, University of Wisconsin, and Vice President, National Academy of Sciences; and Alva R. Davis, Vice Chancellor Emeritus, University of California.

At the request of the University College of the West Indies at Kingston, Jamaica, via the International Cooperation Administration, the Academy provided the services of William I. Myers, former Dean of the College of Agriculture, Cornell University, and Richard Bradfield, Department of Agronomy, Cornell University, for the period June 19–23, to conduct a study to determine the specific equipment needs of the university's five departments of science.

Another team also selected by the Committee on Inter-American Scientific Cooperation will conduct a survey of scientific and engineering education in selected institutes of higher learning in Brazil. This group, which departed for Brazil on July 2 for approximately two months, is composed of Oliver C. Carmichael, former President of the University of Alabama; James S. Coles,

President of Bowdoin College; Linton E. Grinter, University of Florida; and Folke Skoog, University of Wisconsin.

THE MARITIME RESEARCH ADVISORY COMMITTEE

The Maritime Research Advisory Committee, organized by the Academy–Research Council at the request of the U. S. Maritime Administration, has outlined a maritime research program aimed at developing a United States merchant fleet of such technological superiority that it would —even with greatly reduced subsidies— be able to compete in international trade.

A total of 55 senior scientists and engineers served the Committee and its seven advisory panels, under the direction of the Committee Chairman Louis H. Roddis, Jr., President, Pennsylvania Electric Company. This same Committee previously issued the WALRUS Report on the role of the United States merchant marine in national security (*see* NEWS REPORT, Vol. X, no. 1, p. 8).

Recognizing that many non-technological problems are also involved, the Committee looks to automation as the principal means of achieving its goal—through possible reduction in crew size and the institution of greater productivity and efficiency in the handling of cargo.

Specifically, the Committee recommends that the Maritime Administration request appropriations of $10–$12 million annually during the next decade for non-nuclear research; that the proposed research be carried out largely through outside contracts, particularly through universities in order to promote maritime related education; and that the Administration encourage the maritime industry itself to invest more money in research.

The members of the Maritime Research Advisory Committee are:

LOUIS H. RODDIS, JR., President, Pennsylvania Electric Company

ADM. W. M. CALLAGHAN, U. S. N. (Ret.), Chairman, Maritime Cargo Transportation Conference, and consultant, Marine Transport Lines, Inc.

GLEN D. CAMP, Professor of Operations Research, Case Institute of Technology

ROGER H. GILMAN, Director of Port Development, The Port of New York Authority

JESSE E. HOBSON, Vice President and Director of Research, United Fruit Company

M. P. O'BRIEN, former Dean of Engineering, University of California at Berkeley

MILTON S. PLESSET, Professor of Applied Mechanics, California Institute of Technology

ADM. ARTHUR W. RADFORD, U. S. N. (Ret.), former Chairman, Joint Chiefs of Staff

C. RICHARD SODERBERG, former Dean of Engineering, Massachusetts Institute of Technology

ADM. E. H. THIELE, U. S. C. G., Chairman, Ship Structure Committee, and Engineer-in-Chief, U. S. Coast Guard

COMMODORE EDWARD M. WEBSTER, U. S. C. G. (Ret.), Chairman, Radio Technical Commission for Marine Services.

Harry Benford served as Executive Director of the study. Other staff members participating in this study included David K. Felbeck, Executive Director of the Committees on Ship Steel and Ship Structural Design, and Adm. E. G. Fullinwider, U. S. N. (Ret.), Executive Director of the Maritime Cargo Transportation Conference.

SYMPOSIUM ON EXPERIMENTATION BELOW THE MICROGRAM RANGE

The National Academy of Sciences—National Research Council sponsored a symposium on "Experimentation Below the Microgram Range," May 15–18, in Washington, D. C. Nicholas D. Cheronis of Brooklyn College was chairman of the planning committee and general chairman of the symposium. Attendance was limited to the 27 invited participants.

Consideration was given to the unique problems encountered in experimentation below the microgram range. These included: *1*) the need for nomenclature pertaining to the 10^{-15} to 10^{-30} gram range and for a general name to describe the area; *2*) need for refinement of present methods for determining all physical constants required to establish purity and identity in this range; *3*) need to determine lower limits of organic reactions; *4*) need for examination of theoretical problems involved, particularly as to what type of chemical kinetics apply at extremely low concentrations; and *5*) need for re-examination of our concepts of purity and identity.

UNITED STATES DELEGATIONS TO INTERNATIONAL MEETINGS

Six of the member unions of the International Council of Scientific Unions are holding general assemblies this year. The President of the National Academy of Sciences–National Research Council has appointed official delegations to represent United States scientists at the meeting of each Union.

The composition of the voting delegations is given below:

Twelfth General Assembly of the International Union of Geodesy and Geophysics Helsinki, Finland, July 25–August 6, 1960

LLOYD V. BERKNER, Associated Universities, Inc., *Chairman* and *Principal Delegate*
F. W. REICHELDERFER, U. S. Weather Bureau, *Deputy Chief Delegate*
LEROY R. ALLDREDGE, U. S. Department of Commerce
WALTER B. LANGBEIN, U. S. Geological Survey
THOMAS F. MALONE, Travelers Insurance Company
WALTER H. MUNK, Scripps Institution of Oceanography
LEONARD M. MURPHY, U. S. Coast and Geodetic Survey
CHARLES PIERCE, U. S. Coast and Geodetic Survey
J. F. SCHAIRER, Geophysical Laboratory

Tenth General Assembly of the International Geographical Union Stockholm, Sweden, August 6–13, 1960

J. WARREN NYSTROM, U. S. Chamber of Commerce, *Chairman*
WALLACE W. ATWOOD, JR., National Academy of Sciences–National Research Council
CARLETON P. BARNES, U. S. Department of Agriculture
ARTHUR L. BURT, U. S. Department of State
EDWARD B. ESPENSHADE, JR., Northwestern University
EDWIN J. FOSCUE, Southern Methodist University
CLARENCE F. JONES, Northwestern University
GEORGE KISH, University of Michigan
PEVERIL MEIGS, Quartermaster Research and Engineering Command
OSBORN M. MILLER, American Geographical Society
LOUIS O. QUAM, U. S. Office of Naval Research
KIRK H. STONE, University of Wisconsin
SAMUEL VAN VALKENBURG, Clark University

Fifth General Assembly of the International Union of Crystallography Cambridge, England, August 15–24, 1960

B. E. WARREN, Massachusetts Institute of Technology, *Chairman*
M. J. BUERGER, Massachusetts Institute of Technology
EDWARD W. HUGHES, California Institute of Technology
ELIZABETH A. WOOD, Bell Telephone Laboratories, Inc.
WILLIAM H. ZACHARIASEN, University of Chicago

International Union of the History and Philosophy of Science Stanford, California, August 24–September 2, 1960

ERNEST NAGEL, Columbia University, *Chairman*
NOAM CHOMSKY, Massachusetts Institute of Technology, *Alternate*
ALONZO CHURCH, Princeton University
HERBERT FEIGL, University of Minnesota, *Alternate*
THOMAS KUHN, University of California
HENRY MARGENAU, Yale University
BENSON MATES, University of California, *Alternate*
HENRY MEHLBERG, University of Chicago, *Alternate*
MARSHALL H. STONE, University of Chicago, *Alternate*
ALFRED TARSKI, University of California

Thirteenth General Assembly of the International Scientific Radio Union London, England, September 5–15, 1960

W. E. GORDON, Cornell University, *Chairman*
J. H. DELLINGER, Honorary President, URSI
M. G. MORGAN, Dartmouth College
SAMUEL SILVER, University of California
A. H. WAYNICK, Pennsylvania State University
H. W. WELLS, American Embassy, Rio de Janeiro, *Alternate*

Tenth General Assembly of the International Union of Pure and Applied Physics Ottawa, Canada, September 7–9, 1960

FREDERICK SEITZ, University of Illinois, *Chairman*
JESSE WAKEFIELD BEAMS, University of Virginia
ROBERT D. HUNTOON, National Bureau of Standards
HAROLD H. NIELSEN, Ohio State University
NORMAN F. RAMSEY, Harvard University
RALPH ALANSON SAWYER, University of Michigan

AWARDS IN RADIOLOGICAL RESEARCH

On behalf of the James Picker Foundation, the Academy–Research Council has announced the award of 18 research grants, four fellowships, and three grants for scholars in radiological research for the coming academic year. These awards, totaling approximately $121,000, were recently approved by the Foundation on recommendation of the Committee on Radiology of the Academy–Research Council. The Picker Foundation, with the advice and cooperation of the Academy–Research Council, initiated its program of research grants and fellowships in 1950, and expanded it to include scholar grants in 1953. The objective has been to foster research in and broaden the scope of radiology.

At the same time, the National Research Council of Canada announces on behalf of the Foundation the award of one research grant and one fellowship for the coming academic year. Since 1958, the Canadian National Research Council has served as scientific adviser to the James Picker Foundation with respect to its Canadian program.

The names of the recipients and the nature and location of their research are given below under the type of award.

Research Grants:

Julian L. Ambrus, Roswell Park Memorial Institute, Buffalo, N. Y.
Development of methods to detect areas of myeloid metoplasia.

Sven Bellman, Karolinska Institutet, Stockholm, Sweden
Experimental study of the local vascular response to X-ray injury.

John A. Campbell and Eugene C. Klatte, Indiana University School of Medicine
Comparative studies on the relative diagnostic image quality resulting from the use of film of various sizes in cineradiography.

Erik R. Christensen, University Hospital, Copenhagen, Denmark
Radiological and clinical follow-up study on the late prognosis of pyuria in childhood.

W. Peter Cockshott, University College Hospital, Ibadan, Nigeria
Continuation of anthropological survey and of studies on skeletal maturation.

P. Czerniak, Radium and Isotope Institute, Tel–Hashomer Government Hospital, Tel–Hashomer, Israel
Study of human spermatogenesis using radioactive P^{32}.

F. Dalith, Tel–Hashomer Government Hospital
Studies on the application of tomography to the diagnosis of cardiovascular disorders.

Francis de Friess, College of Physicians and Surgeons, Columbia University
Evaluation of the factors affecting the performance of the grids which are used as an adjunct to diagnostic radiology.

Milton Elkin and Saul Boyarsky, Albert Einstein College of Medicine, Yeshiva University
Physiologic study of obstructive nephrography.

Bertil Jacobson, Karolinska Institutet, Stockholm, Sweden
Continued research involving quantitative *in vivo* analysis of nonradioactive iodine of the thyroid.

Gwilym S. Lodwick and Theodore E. Keats, University of Missouri Medical Center
Continuation of their studies on the vascular and osseous changes occurring in hypertrophic pulmonary osteoarthropathy.

Roscoe E. Miller, Indiana University Medical Center
Research looking toward the improvement of barium enema examination with the aid of efficient suction devices.

Robert C. Schlant and Wade M. Shuford, Emory University School of Medicine
Research on the use of wedge angiography in the evaluation of pulmonary and hepatic vascular disease.

Theodore A. Tristan, University of Pennsylvania Hospital
Studies aimed at developing improved methods of cinefluorographic analysis of gastro-intestinal function, with particular reference to the distal esophagus.

James E. Turner, Northwestern University Medical School
Development of a rapid pre-calculated dosage system for 200 KV arc therapy providing water-equivalent tissue doses for the entire plane of rotation.

Mark H. Wholey, Charleston Memorial Hospital, Charleston, W. Va.
Research on inhalation radiocardiography in the diagnosis of left to right cardiac shunts.

Martin H. Wittenborg, The Children's Medical Center, Boston, Mass.
Investigation of the radiological aspects of mandibular hypoplasia and mandibulofacial dysostosis.

John H. Woodruff, Jr., Los Angeles County Harbor General Hospital
Study of Pyelographic patterns in health and disease.

Grants for Scholars:

Nels M. Strandjord, Continued research on X-ray diagnosis of gastric malignancy—University of Chicago School of Medicine, in the laboratory of Robert D. Moseley, Jr.

Kurt R. Straube, Quantitative and qualitative radiological study of the motion of blood and the development of technics for occlusion angiography—University of Oregon Medical School, in the laboratory of Charles T. Dotter.

Joseph E. Whitley, Continuation of his studies on diagnostic techniques in cardiovascular research —Bowman Gray School of Medicine, in the laboratory of I. Meschan.

Fellowships:

Enzo F. Luzzati, Studies on the radiographic appearance of ischemic conditions of the sinoatrial node—Karolinska Institutet, Stockholm, Sweden, under the guidance of Knut Lindblom.

Rogelio M. Moncada, Research involving measurement of ventricular septal defect size by angiocardiographic methods—Cook County Hospital, Chicago, Ill., under the guidance of Benjamin M. Gasul.

Jose A. Veiga-Pires, Continuation of his microradiographic studies on brain, skin, and muscle and of his angiographic studies of the upper alimentary tract—Royal Northern Hospital, Holloway, London, England, under the guidance of L. S. Carstairs.

Wang Yen, *In vitro* studies of thyroid function with radioactive iodine—Jefferson Medical College, under the guidance of Philip J. Hodes.

NEW COMMITTEES
OFFICE OF DOCUMENTATION

The Office of Documentation has announced the appointment of two new committees. The first of these is an Advisory Committee composed of the following members:

ELMER HUTCHISSON, American Institute of Physics, *Chairman*
WILLIAM O. BAKER, Bell Telephone Laboratories
WALLACE R. BRODE, U. S. Department of State
RALPH G. CLELAND, Indiana University
HIDEN T. COX, American Institute of Biological Sciences
JOHN M. FOGG, University of Pennsylvania
SAMUEL A. GOUDSMIT, Brookhaven National Laboratory
IVER ICELSRUD, Battelle Memorial Institute
CHAUNCEY LEAKE, Ohio State University
PHILIP MORSE, Massachusetts Institute of Technology
ASCHER OPLER, Computer Usage Company, Inc.
GEORGE PETRIE, International Business Machines Corporation
FRED Y. WISELOGLE, The Squibb Institute for Medical Research

The second committee is an ad hoc steering committee established to evaluate a grant from the National Science Foundation to Western Reserve University. Late last year the Foundation awarded the Center for Documentation and Communication Research at Western Reserve a grant to help support a test program for the automatic processing and searching of literature of interest to metallurgists.

Subsequently, the Foundation asked the Academy–Research Council to form an ad hoc committee of metallurgists and information specialists to *1*) participate actively in the further planning of the test program and its development throughout the experimental period; *2*) provide advice, in cooperation with the appropriate committee of the American Society for Metals, on questions that may arise during the course of the test program concerning the activities of the experimental center, including test searches and related studies; and *3*) assume responsibility for evaluating the results of the test program, including the planning of any additional studies needed for a proper evaluation of those results.

STAFF APPOINTMENTS

The Office of International Relations has announced the appointment of **Harry M. Miller, Jr.,** as Coordinator of the Chile Project. Dr. Miller's major responsibility will be the carrying forward, under the guidance of the Committee on Inter-American Scientific Cooperation, a program of assistance in the improvement of scientific facilities and capabilities of the seven universities of Chile. Dr. Miller, who received his Ph.D. degree in zoology from the University of Illinois in 1923, recently retired as an Associate Director of the Rockefeller Foundation upon completion of almost 30 years of association with that organization.

The Committee on International Exchange of Persons has announced the appointment of **Leonard Goodwin** as Assistant to the Executive Secretary. Mr. Goodwin did his undergraduate work in engineering physics and holds an M.A. degree in educational psychology from the University of Chicago. He was assistant professor of community dynamics and psychology at Earlham College before coming to the Academy–Research Council.

F. Clayton Rose joined the staff of the Prevention of Deterioration Center as a Research Assistant on August 1, to replace **Richard J. Mann,** who resigned to study for the ministry. Mr. Rose is a graduate of the U. S. Naval Academy with a B.S. degree in engineering and has studied law at the College of William and Mary and Georgetown University, as well as completing courses in operations research. Prior to coming to the Academy–Research Council he served as supply officer (controller) at the U. S. Naval Communications Station in Washington, D. C., for 2 years. Mr. Rose will work in the fields of materials engineering and environmental documentation.

The Division of Earth Sciences has announced the appointment of **Linn Hoover** as Executive Secretary of the Division effective July 1. Dr. Hoover will replace **Adrian Richards** who has been on leave of absence from the U. S. Hydrographic Office while serving as Acting Executive Secretary of the Division. Before coming to the Academy–Research Council, Dr. Hoover was with the U. S. Geological Survey.

RECORD OF MEETINGS

May	
2	Committee on Revision of Mathematical Tables
	AASHO Road Test National Advisory Committee, *LaSalle, Ill.*
3	Committee on Cereal and Baked Products, *Chicago*
4	Federal Construction Council, Operating Committee
5	Office of Critical Tables, Executive Committee
	Department of Defense Standing Review Committee 7 on Evaluation
5–6	Symposium on Quantitative Problems in Geography, *Chicago*
5–8	Armed Forces–National Research Council Committee on Bio-Astronautics, Panel on Acceleration, *Indialantic, Fla.*
6	U. S. National Committee, International Union of Pure and Applied Chemistry
7	Committee on Soils-Calcium-Chloride Roads, *Wernersville, Pa.*
9	Committee on Atmospheric Sciences
	Committee on Soils-Sodium Chloride Stabilization, *Lafayette, Ind.*
10	Armed Forces–National Research Council Committee on Bio-Astronautics, Executive Council, *Bal Harbour, Fla.*
11	U. S. National Committee, International Institute of Refrigeration
12	Advisory Committee on the Atomic Bomb Casualty Commission, *San Francisco*
13	Subcommittee on Atmospheric and Industrial Hygiene
	Agricultural Research Institute, Conference Committee
14	Committee on Waste Disposal, Advisory to the Atomic Energy Commission, *Hutchinson, Kans.*
15	Committee on Foods, *San Francisco*
15–18	Symposium on Experimentation Below the Microgram Range
16	U. S. National Committee, International Union Against Cancer
	Department of Traffic and Operations, Task Force on Shoulders
17–18	Conference on Blend Fabrics, *Natick, Mass.*
18–19	Subcommittee on Food Technology, *San Francisco*

May	
19	Ad hoc Committee on Education in Tropical Africa
	Committee on Pioneering Research, *Natick, Mass.*
	Highway Research Board Special Committee on Public Dissemination of Research Findings
	Advisory Panel to the National Bureau of Standards Applied Mathematics Division
20	Ad hoc Evaluation Committee on National Science Foundation Grant to Western Reserve University
	Committee on Climatology and Meteorology, *Kansas City, Mo.*
	Office of Documentation, Ad hoc Steering Committee
21	Special Committee on Publication of Selected Information on Theory of Traffic Flow, *New York City*
24	Subcommittee on Waste Disposal
24–25	Prevention of Deterioration Center, Scientific Advisory Committee and Services Technical Committee, Annual Meeting
25	U. S. National Committee, International Mathematical Union, *Princeton*
26	Committee on Physical Anthropology
	Committee on Soil and Water Conservation, *Ames, Iowa*
30–31	Executive Committee, Fifth International Congress on Nutrition
31	Subcommittee on Water Supply
June	
1	Department of Defense Standing Review Committee 6 on Fabrication and Processing Techniques
1–3	Committee on Sarcoidosis, International Conference on Sarcoidosis
2	Materials Advisory Board
	Committee on Plastics and Elastomers, Task Group on Structural Plastic Foams, *Natick, Mass.*
	Committee on Cartography, Advisory to the Department of State
3	U. S. National Committee, International Union of Biological Sciences
	Committee on Tissue Transplantation, Conference on the Methods of Assay and Chemical Nature of Tissue Transplantation Antigens

June	
7	Committee on Sanitary Engineering and Environment
	Committee on the Survey of Medical Research in the Veterans Administration
8	Subcommittee on Plasma
	Armed Forces–National Research Council Committee on Bio-Astronautics, Panel on Biological Orientation and Navigation, *Cold Spring Harbor, N. Y.*
8–9	Conference on Microbiological Standards for Foods
9	Committee on Shock
9–10	Committee on Photogrammetry and Aerial Surveys, *Cheyenne*
10	U. S. National Committee, International Geographical Union
	Building Research Advisory Board, Advisory Committee to Federal Construction Council and Agency Administrators, Annual Meeting
	Committee on Trauma
	Planning Committee on Role of Chemicals in Modern Food Production
11	Division of Earth Sciences, Executive Committee
12	National Academy of Sciences–National Research Council, Governing Board
13	U. S. Committee on Mathematical Instruction, *Boston*
14	Committee on Pest Control and Wildlife Relationships
15	Advisory Board on Quartermaster Research and Development
	Food Protection Committee
15–17	Ad hoc Committee on Research Problems of Mutual Interest and Concern to Users and Producers of Asphaltic Materials, *San Francisco*
16	Committee on Radiation Preservation of Food, *Chicago*

June	
17	Office of Documentation, Advisory Committee
	Committee on International Exchange of Persons, Area Review Committees
18	Committee on International Exchange of Persons
20–21	Committee on Microbiological Deterioration Test Procedures
20–24	Gordon Conference on Information Processing for Critical Tables of Scientific Data, *New Hampton, N. H.*
22	Committee on Microbiology of Food, *Chicago*
23	Committee on Textile Dyeing and Finishing, *Natick, Mass.*
24	Division of Engineering and Industrial Research, Executive Committee, *New York City*
	Ad hoc Committee on Space Mathematics
	Committee on Theory of Traffic Flow, *Kansas City, Mo.*
25	Agricultural Board, Executive Committee
27	Advisory Board on Quartermaster Research and Development, *Natick, Mass.*
28	Office of Documentation, Ad hoc Meeting on Biomedical Information
28–30	Committee on Waste Disposal, Advisory to the Atomic Energy Commission, *Richfield, Wash.*, and *Idaho Falls, Idaho*
29	Executive Committee, Fifth International Congress on Nutrition
29–30	Highway Research Board, Executive Committee, *York Harbor, Me.*
30	Maritime Research Advisory Committee
30–July 1	Committee for Study of Safety in School Fires

NEW PUBLICATIONS

Criscuolo, E. L., *et al. Manual of Isotope Radiography.* Washington, NAS–NRC, 1960. (Ship Structure Committee. Serial No. SSC-121.) 48 p.

Emery, K. O., and Sears, Mary. *An International Directory of Oceanographers.* 3rd ed. Washington, NAS–NRC, 1960. 177 p.

Ledley, Robert S. *Report on the Use of Computers in Biology and Medicine.* Washington, NAS–NRC, 1960. 74 p., illus.

McMurray, William M., *comp. IGY Meteorological Data on Microcards.* Washington, NAS–NRC, 1959. (National Academy of Sciences, IGY World Data Center A. IGY General Report No. 9.) 142 p. $1.00.

National Academy of Sciences. IGY World Data Center A. *Sixth 6-Monthly Catalogue of Data in IGY World Data Center A. Data Received by WDC-A During the Period 1 July 1957–30 June 1960.* Washington, NAS–NRC, 1960. (IGY General Report No. 10.) 154 p. $1.00.

National Academy of Sciences. IGY World Data Center A. Rockets and Satellites. *Observations of Corpuscular Radiation with Satellites and Space Probes.* Washington, NAS–NRC, 1960. (IGY Satellite Report Series No. 11.) 125 p. $1.00.

National Research Council. Building Research Institute. *The Current Status of Modular Coordination. A Research Correlation Conference. . .* Washington, 1960. (NAS–NRC Publication 782.) 32 p., illus. $2.50.

National Research Council. Building Research Institute. *The Design Potential of Metal Curtain Walls.* Washington, 1960. (NAS–NRC Publication 788.) 84 p., illus. $5.00.

National Research Council. Committee on Oceanography. *Oceanography 1960 to 1970. 4–Oceanographic Research for Defense Applications.* [Chapter 4 of a report in progress.] Washington, NAS–NRC, 1960. 15 p.

National Research Council. Committee on Seismological Stations. *Specifications for a World-Wide Network of Standardized Seismographs.* Washington, NAS–NRC, 1960. 8 p.

National Research Council. Highway Research Board. *Asphaltic Concrete Construction, Field and Laboratory Studies. . .* Washington, 1960. (NAS–NRC Publication 740. Highway Research Board Bulletin 251.) 37 p., illus. $1.00.

National Research Council. Highway Research Board. *Field Applications of Soil Consolidation: Time-Dependent Loading and Varying Permeability. . .* Washington, 1960. (NAS–NRC Publication 734. Highway Research Board Bulletin 248.) 25 p. $0.60.

National Research Council. Highway Research Board. *Highway Needs and Programming Priorities. . .* Washington, 1960. (NAS–NRC Publication 738. Highway Research Board Bulletin 249.) 75 p. $1.80.

National Research Council. Highway Research Board. *Pavement Performance Concepts. . .* Washington, 1960. (NAS–NRC Publication 739. Highway Research Board Bulletin 250.) 58 p., illus. $1.40.

National Research Council. Highway Research Board. *Sign Supports, Foundation Design. . .* Washington, 1960. (NAS–NRC Publication 733. Highway Research Board Bulletin 247.) 35 p., illus. $0.80.

Ramiríz E., Ricardo, *et al. Races of Maize in Bolivia.* Washington, 1960. (NAS–NRC Publication 747.) 159 p., illus. $1.50.

U.S. National Committee for the International Institute of Refrigeration. *Activities Report for the Year 1959.* Washington, NAS–NRC. 1960. 41 p.

van der Veen, J. H. *Influence of Steel-Making Variables on Notch Toughness.* Washington, NAS–NRC, 1960. (Ship Structure Committee. Serial No. SSC-128.) 33 p.

Notice of Academy Meetings

NATIONAL ACADEMY OF SCIENCES

Autumn Meeting, University of Pennsylvania, Philadelphia, Pa., November 14–16, 1960

Annual Meeting, Washington, D. C., April 24–26, 1961

NATIONAL ACADEMY OF SCIENCES–NATIONAL RESEARCH COUNCIL

Governing Board, Washington, D. C., October 9, 1960

Governing Board, Washington, D. C., December 11, 1960

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The search for Truth is in one way hard and in another easy. For it is evident that no one can master it fully nor miss it wholly. But each adds a little to our knowledge of Nature, and from all the facts assembled there arises a certain grandeur.

—ARISTOTLE